WHAT IS CLAIMED IS

1. Spindle-shaped goethite particles having an average minor axial diameter of 0.05 to 0.18 μm, an aspect ratio of from more than 6:1 to less than 10:1, a size distribution (standard deviation/average major axial diameter) of not more than 0.20, a Co content of from 0.5 to less than 6 atm% based on whole Fe; an Al content of from more than 10 to less than 20 atm% based on whole Fe, and an atomic ratio of Al to Co of from more than 2 to 4.

2. Spindle-shaped goethite particles according to claim 1, which have a Co content of from 0.5 to less than 5 atm% based on whole Fe; an Al content of from 10.5 to 18 atm% based on whole Fe and an atomic ratio of Al to Co of from 2.10 to 3.90.

3. Spindle-shaped goethite particles according to claim 1, which further have a BET surface area of 130 to 200 m^2/g, a crystallite size D_{020} of 150 to 250 Å, a crystallite size D_{110} of 80 to 120 Å and a crystallite size ratio of D_{020}/D_{110} of 1.8 to 2.4.

4. Spindle-shaped goethite particles having an average major axial diameter of 0.05 to 0.18 μm, an aspect ratio of from more than 6:1 to less than 10:1, a size distribution

(standard deviation/average major axial diameter) of not more than 0.20, a Co content of from 0.5 to less than 5 atm% based on whole Fe; an Al content of from 10.5 to less than 18 atm% based on whole Fe, an atomic ratio of Al to Co of from 2.10 to 3.90, a crystallite size D_{020} of 150 to 250 Å, a crystallite size D_{110} of 80 to 120 Å and a crystallite size ratio of D_{020}/D_{110} of 1.8 to 2.4.

5. Spindle-shaped hematite particles having an average major axial diameter of 0.05 to 0.17 μm, an aspect ratio of from more than 6:1 to less than 10:1, a size distribution (standard deviation/average major axial diameter) of not more than 0.22, a crystallite size D_{104} of 100 to 140 Å, a Co content of from 0.5 to less than 6 atm% based on whole Fe; an Al content of from more than 10 to less than 20 atm% based on whole Fe, a rare earth element content of from 1.5 to 5 atm% based on whole Fe, and an atomic ratio of Al to Co of from more than 2 to 4.

6. Spindle-shaped hematite particles according to claim 5, which have a Co content of from 0.5 to less than 5 atm% based on whole Fe; an Al content of from 10.5 to 18 atm% based on whole Fe, a rare earth element content of from 2.0 to 4.8 atm% based on whole Fe, and an atomic ratio of Al to Co of from 2.10 to 3.90.

7. Spindle-shaped hematite particles according to claim 5, which further have a BET surface area of 40 to 70 m^2/g, a crystallite size D_{110} of 200 to 300 Å, and a crystallite size ratio D_{110}/D_{104} of from 2.0 to 4.0.

8. Spindle-shaped hematite particles having an average major axial diameter of 0.05 to 0.17 μm, an aspect ratio of from more than 6:1 to less than 10:1, a size distribution (standard deviation/average major axial diameter) of not more than 0.22, a crystallite size D_{104} of 100 to 140 Å, a Co content of from 0.5 to less than 5 atm% based on whole Fe; an Al content of from 10.5 to less than 18 atm% based on whole Fe, a rare earth element content of from 2.0 to 4.8 atm% based on whole Fe, an atomic ratio of Al to Co of from 2.10 to 3.90, a crystallite size D_{110} of 200 to 300 Å, and a crystallite size ratio of D_{110}/D_{104} of 2.0 to 4.0.

9. Spindle-shaped magnetic metal particles containing iron as a main component, having an average major axial diameter of 0.05 to 0.15 μm, an aspect ratio of from 5:1 to 9:1, a size distribution (standard deviation/average major axial diameter) of not more than 0.30, a crystallite size D_{110} of 130 to 160 Å, a Co content of from 0.5 to less than 6 atm% based on whole Fe, an Al content of from more than 10

to less than 20 atm% based on whole Fe, a rare earth element content of from 1.5 to 5 atm% based on whole Fe, an atomic ratio of Al to Co of from more than 2 to 4, a coercive force of 111.4 to 143.2 kA/m, an oxidation stability of saturation magnetization ($\Delta\sigma s$) of not more than 10%, and an ignition temperature of not less than 130℃.

10. Spindle-shaped magnetic metal particles containing iron as a main component according to claim 9, which have a Co content of from 0.5 to less than 5 atm% based on whole Fe, an Al content of from 10.5 to 18 atm% based on whole Fe, a rare earth element content of from 2.0 to 4.8 atm% based on whole Fe, and an atomic ratio of Al to Co of from 2.10 to 3.90.

11. Spindle-shaped magnetic metal particles containing iron as a main component according to claim 9, which further have a BET surface area of 40 to 60 m^2/g.

12. Spindle-shaped magnetic metal particles containing iron as a main component containing iron as a main component, having an average major axial diameter of 0.05 to 0.15 μm, an aspect ratio of from 5:1 to 9:1, a size distribution (standard deviation/average major axial diameter) of not more than 0.30, a crystallite size D_{110} of 130 to 160 Å, a Co

content of from 0.5 to less than 5 atm% based on whole Fe; an Al content of from 10.5 to less than 18 atm% based on whole Fe, a rare earth element content of from 2.0 to 4.8 atm% based on whole Fe, an atomic ratio of Al to Co of from 2.10 to 3.90, a coercive force of 111.4 to 143.2 kA/m, an oxidation stability of saturation magnetization ($\Delta\sigma s$) of not more than 10%, and an ignition temperature of not less than 130℃.

13. A process for producing the spindle-shaped goethite particles as defined in claim 1, which process comprises:

aging a water suspension containing a ferrous-containing precipitate produced by reacting a mixed aqueous alkali solution comprising an aqueous alkali carbonate solution and an aqueous alkali hydroxide solution with an aqueous ferrous salt solution in a non-oxidative atmosphere;

conducting an oxidation reaction of the water suspension by passing an oxygen-containing gas therethrough, thereby producing spindle-shaped goethite seed crystal particles,

upon the production of the seed crystal particles, a Co compound being added in an amount of from 0.5 to less than 6 atm%, calculated as Co, based on whole Fe, to the water suspension containing the ferrous-containing precipitate during aging thereof but prior to the elapse of half a

period of the whole aging time before initiation of the oxidation reaction, and the oxidation reaction being conducted such that 40 to 50% of whole Fe^{2+} is oxidized; and

after adding an Al compound in an amount of from more than 10 to less than 20 atm%, calculated as Al, based on a whole Fe, to the water suspension containing both the ferrous-containing precipitate and the spindle-shaped goethite seed crystal particles, passing again an oxygen-containing gas through the resultant water suspension so as to conduct an oxidation reaction thereof, thereby growing a goethite layer on the surface of each seed crystal particle.

14. A process for producing the spindle-shaped hematite particles as defined in claim 5, which process comprises:

treating the spindle-shaped goethite particles obtained by the process according to claim 13 with an anti-sintering agent containing a rare earth compound in an amount of 1.5 to 5 atm%, calculated as a rare earth element, based on whole Fe; and

heat-treating the thus treated spindle-shaped goethite particles at a temperature of 650 to 800℃ in a non-reducing atmosphere.

15. A process for producing the spindle-shaped magnetic metal particles containing iron as a main component as

defined in claim 9, which process comprises:

heat-reducing the spindle-shaped hematite particles obtained by the process according to claim 14 at 400 to 700℃ in a reducing atmosphere.

16. A magnetic recording medium comprising a non-magnetic substrate and a magnetic recording layer formed on the non-magnetic substrate comprising a binder resin and spindle-shaped magnetic metal particles containing iron as a main component, which have an average major axial diameter of 0.05 to 0.15 μm, an aspect ratio of 5:1 to 9:1, a size distribution (standard deviation/average major axial diameter) of not more than 0.30, a crystallite size D_{110} of 130 to 160 Å, a Co content of from 0.5 to less than 6 atm% based on whole Fe; an Al content of from more than 10 to less than 20 atm% based on whole Fe, a rare earth element content of 1.5 to 5 atm% based on whole Fe, an atomic ratio of Al to Co of from more than 2 to 4, a coercive force of 111.4 to 143.2 kA/m, an oxidation stability of saturation magnetization ($\Delta\sigma s$) of not more than 10%, and an ignition temperature of not less than 130℃.